Ted Mackereth, Ph.D.

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PhD in Astrophysics with focus on statistics, machine learning and high performance computational methods. Natural problem solver and generalist. 3 years experience in post-doctoral research and senior data science, thrives in fast-paced, deadline-driven environments, seeking new challenges and growth in data and industry.

EXPERIENCE

Senior Data Scientist
2022 - Present

OceanMind, Harwell Campus, Oxfordshire, UK

- Senior, management level role conducting research and development of new IP at a non-profit company in the maritime conservation and enforcement sector.
- Supporting development and maintenance of a cutting-edge ML engine that applies **speech recognition tech (C++, C#, Azure)** to detect and characterise fishing activities from vessel **satellite imaging** and telemetry to prevent illegal, unregulated and unreported fishing and provide intelligence on other maritime activities.

Banting, CITA and Dunlap Postdoctoral Fellow
2020 - 2022

Canadian Institute for Theoretical Astrophysics, University of Toronto, Canada

- Nationally funded independent researcher in galactic astrophysics overseeing a broad range of solo and collaborative projects using large scale **hydrodynamical simulations** and **multi-dimensional observational data** sets (through SQL), applying **Bayesian modelling** and **machine learning** technques with **PyTorch**, **Pyro** and **scikit-learn**

Galactic Archaeology Postdoctoral Fellow
2019 - 2020

School of Astronomy & Astrophysics, University of Birmingham, UK

- Providing expertise on galaxy evolution to a stellar astrophysics group
- Applying **Fourier Analysis**, **Gaussian Process models**, **Hierarchical Bayesian modelling** to **time-series data** using **PyMC3**, **Stan**, **Keras**

PROJECTS

Artificial Neural Networks for age-dating 400,000 stars

- Developed pipelines and Bayesian CNN models for fast and reliable prediction of ages in 400,000 stars from high-dimensional spectroscopic data

Advanced Bayesian models of the structure of the Milky Way

- Applied inhomogeneous spatial Poisson point process models to make detailed maps of the structure of our Galaxy from incomplete and noisy data

Inferring and visualising fishing activity from satellite data

- Supported the late stage development of an algorithm employing a viterbi decoder to parse fishing vessel satellite telemetry (AIS), to infer fishing activity for global fishing fleets.

EDUCATION

PhD, Astrophysics
2015 - 2019

Astrophysics Research Institute, Liverpool John Moores University, UK

- Developed novel algorithm for determining orbits of stars in the Milky Way

MPhys, Astrophysics
2011 - 2015

University of Liverpool, UK

- Graduated 1st Class w/ Honours. Courses included statistics, computational physics, dynamics

LANGUAGES

FLUENT
python SQL

COMPETENT
R Julia C/C++ MATLAB

TOOLS

Numpy Scipy scikit-learn
PyTorch Pyro Keras PyMC
TensorFlow BigQuery
plotly/Dash Matplotlib
Figma Google Cloud
GDAL/QGIS

SKILLS

Statistics AI/ML
Data Visualisation
Geospatial Data
Time-series analysis
Communication Mentoring
Leadership Critical Thinking
Problem Solving
Project Management

AWARDS & HONOURS

Thesis Prize
2019 LJMU Faculty of Engineering Thesis Prize

Banting Postdoctoral Fellowship
One of Canada's most competitive postdoctoral awards

James Webb Space Telescope
Lead a proposal which was awarded some of the first observing time

INTERESTS

Design Architecture Hiking
Open Science/Data Art